

**RABEAA POINT OF ENTRY
SCREENING FACILITY
RABEAA, IRAQ**

**SIGIR PA-09-173
JANUARY 11, 2010**

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SIGIR

Special Inspector General for Iraq Reconstruction

January 11, 2010

Rabeaa Point of Entry Screening Facility

Summary of Report: PA-09-173

Why SIGIR Did this Study

SIGIR is charged to conduct assessments of Iraq reconstruction projects funded with amounts appropriated or made available by the U.S. Congress. SIGIR assessed this project to provide real-time information on relief and reconstruction to interested parties to enable appropriate action, when warranted.

The objective of this project assessment was to determine if:

- project components were adequately designed
- construction complied with design standards
- adequate quality management programs were used
- project sustainability was addressed
- project results were consistent with original objectives

What SIGIR Recommends

SIGIR recommends that the Mosul Area Office of the U.S. Army Corps of Engineers:

1. Compare actual construction to contract and design drawing requirements.
2. Determine if cost savings are due to the U.S. government for the approval of alternative materials and methods.
3. Require the contractor to repair any construction defects without cost increases to the U.S. government.
4. Enforce the contractor safety plan.
5. Implement controls to ensure that the procedures outlined in the quality management plan are applied.

Management Comments

SIGIR received comments on the draft of this report from the USACE, Gulf Region District concurring with the recommendations and documenting corrective actions taken.

Evaluation of Comments

The comments addressed the issues identified in SIGIR's recommendations.

What SIGIR Found

On 17 May 2009, SIGIR performed an on-site assessment of the Rabeaa Point of Entry Screening Facility project. A point of entry is a place where one lawfully enters a country. It typically has a staff that verifies passports and visas and inspects luggage to assure that contraband is not imported. The objective of this Iraq Security Forces Fund \$3.1 million project was to provide a new 1,230 square meter single-story screening facility and multiple support structures, such as a water distribution system, septic system, electrical distribution system, one-megawatt generator, and demolition of existing buildings.

At the time of the site visit, the project was approximately 60% complete. SIGIR observed ongoing construction work, such as concrete formwork and preparation for concrete placement. SIGIR identified a number of construction deficiencies, including:

- construction that did not adhere to the contract's Statement of Work
- construction that was not in compliance with design drawings
- defective construction
- safety concerns

The contractor's implementation of the quality control program and the U.S. government's application of the quality assurance program were not effective in monitoring this construction project.

SIGIR discussed these issues with personnel from the Mosul Area Office of the U.S. Army Corps of Engineers (USACE) Gulf Region District. Mosul Area Office representatives stated that the contractor would address these issues throughout the project, and corrective action would be taken.

Although SIGIR identified significant issues with this project, the actions that the Gulf Region District indicate that they will take should remedy the identified deficiencies and should result in a new functioning Rabeaa Point of Entry Screening Facility.



For more information, contact SIGIR Public Affairs at (703) 428-1100 or PublicAffairs@sigir.mil



SPECIAL INSPECTOR GENERAL FOR IRAQ RECONSTRUCTION

January 11, 2010

MEMORANDUM FOR COMMANDING GENERAL, UNITED STATES CENTRAL
COMMAND
COMMANDING GENERAL, UNITED STATES FORCES-
IRAQ
COMMANDING GENERAL, JOINT CONTRACTING
COMMAND-IRAQ/AFGHANISTAN
DIRECTOR, IRAQ TRANSITION ASSISTANCE OFFICE

SUBJECT: Report on the Rabeaa Point of Entry Screening Facility, Rabeaa, Iraq
(SIGIR Report Number PA-09-173)

We are providing this project assessment report for your information and use. We assessed the design and construction work performed at the Rabeaa Point of Entry Screening Facility, Rabeaa, Iraq to determine its status and whether objectives intended will be achieved. This assessment was made to provide you and other interested parties with real-time information on a relief and reconstruction project underway and in order to enable appropriate action to be taken, if warranted.

Comments on a draft of this report from the Gulf Region District of the U.S. Army Corps of Engineers addressed our recommendations and provided documentation and photographs of the corrective actions implemented. As a result, no additional comments are required.

We appreciate the courtesies extended to our staff by the United States Forces-Iraq and the offices of the Gulf Region District of the U.S. Army Corps of Engineers. If you have any questions please contact Mr. Brian M. Flynn at brian.flynn@sigir.mil or at 240-553-0581, extension 2485. For public queries concerning this report, please contact SIGIR Public Affairs at publicaffairs@sigir.mil or at 703-428-1100.

A handwritten signature in black ink, which appears to read "Stuart Bowen, Jr.", is positioned above the printed name.

Stuart W. Bowen, Jr.
Inspector General

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Introduction

Objective of the Project Assessment

The objective of this project assessment was to provide real-time relief and reconstruction project information to interested parties to enable appropriate action, if warranted. Specifically, the Special Inspector General for Iraq Reconstruction (SIGIR) determined whether:

1. Project components were adequately designed prior to construction or installation;
2. Construction or rehabilitation is in compliance with the standards of the design;
3. Adequate quality management programs are being utilized;
4. Sustainability was addressed in the contract or task order for the project; and
5. Project results were or will be consistent with their original objectives.

Pre-Site Assessment Background

Contract, Costs and Payments

On 31 May 2008, the Gulf Region Division, Northern District (GRN) awarded Contract W917BE-08-C-0066, a firm-fixed-price contract to Biltex Construction Company, Ankara, Turkey in the amount of \$3,095,267. The project was funded by the Iraq Security Forces Fund. The contract contained three amendments and/or modifications:

- A00002, dated 2 June 2008, descope the asphalt paving and replaced the paving with concrete road paving. The amendment to the scope of work did not affect the cost or time of the project.
- P00001, dated 16 December 2008, increased the contract amount by \$14,320.66 from \$3,095,267 to \$3,109,587.66. The modification increased the size of the septic tank capacity in order to meet the needs of the facility's public restrooms. Also, the modification accommodated the additional excavation of 20 linear meters from the original location for the Point of Entry (POE)¹ building foundations. In order to accomplish the tasks, the modification extended the period of performance by 20 calendar days, from 180 days to 200 days.
- P00002, dated 5 January 2009, extended the period of performance by 23 days for a total of 223 days from the Notice to Proceed dated 9 August 2008. The total cost of the project did not change.

Project Objective

The overall objective of this project was to construct a new screening facility at the existing Rabeaa POE. Prior to this project, the town of Rabeaa had an existing POE. However, the new POE project will help consolidate operations and enhance contraband detection procedures.

¹ A point of entry is a place where one may lawfully enter a country. It typically has a staff that verifies passports and visas and inspects luggage to ensure that contraband is not imported.

Pre-Construction Description

The Rabeaa POE Screening Facility project is located about 450 miles north-northwest of Baghdad. The project is in the Ninewa governorate, on the Iraq – Syria border and is situated on developed land that is slightly elevated.

Statement of Work

The Statement of Work (SOW) required the contractor to design and construct a new Rabeaa POE screening facility in Iraq. The project consisted of new construction in support of the existing POE and construction of multiple support structures. The SOW required the construction of the following:

- screening facility
- water distribution system
- septic system
- electrical distribution
- a one-megawatt generator
- demolition of previous buildings

The SOW required the contractor to ensure that the 1,230 square meters of inhabitable space in the screening facility be ventilated, air-conditioned, heated, and insulated.

Project Design and Specifications

The contractor was required to provide resources, personnel, equipment, and management necessary to construct the new Rabeaa POE Screening Facility. The contractor was allowed to choose from construction types such as pre-engineered buildings, metal building systems, insulated concrete foam buildings, or from building materials commonly used, such as brick. In addition, the SOW included a conceptual floor plan of a 1,230 square meter heated and cooled, single-story facility. The SOW included more specific requirements for the site utilities (water, sewer, and electrical systems) and interior finishes.

Also, the SOW included requirements for the submittal and approval of project designs and specifications. The SOW required submission of a 35% design submittal and 100% submittal of construction documents for review and approval prior to the start of any construction.

The SOW required conformance to the following codes and standards for the design and construction:

- International Building Code
- International Plumbing Code
- International Mechanical Code
- International Electrical Code
- International Fire Code
- International Electro-technical Commission
- Illuminating Engineering Society of North America

The GRN Mosul Area Office provided SIGIR with the 35% and 100% design documents submitted by the contractor. The 100% design drawings, not yet approved by the GRN Mosul Area Office, were used by the contractor for the construction of the project and consisted of civil, architectural, electrical,

mechanical, plumbing, and structural drawings. In addition, GRN provided the project's calculations and submittals.

Civil and Architectural Design

The contractor submitted the 100% design drawings, which included both civil and architectural drawings in a combined package. The civil design package included:

- layout of the interior floor plan of the screening building
- location and layout of the water pump house and water tank
- location and layout of the electrical generator and fuel tank
- location and layout of the exterior sidewalks and fencing
- elevations and cross sectional views of the proposed building
- miscellaneous renderings and architectural details

The civil design package included more architectural plans than civil drawings and the actual civil site plan (Figure 1) lacked details on topography, roadways, parking, and other typical site plan requirements. A primary concern was the lack of any drainage plan in the civil site plan. The contractor noted in the geotechnical report that drainage could contribute to future foundation problems.



Figure 1. Civil site plan (Courtesy of USACE)

According to the GRN Mosul Area Office representative, the contractor had not received 100% design approval. However, GRN allowed the contractor to start construction of the project. SIGIR determined that the architectural designs along with the detailed submittal packages were adequate to construct the facility.

Mechanical and Plumbing Design

The contractor submitted the 100% mechanical drawings that included:

- heating, ventilating, and air conditioning (HVAC) and plumbing system equipment schedules
- layout of the HVAC system over the proposed floor plan
- isometric views of the HVAC system
- layout of the site water system that included the pump house
- interior water and wastewater plumbing layout
- miscellaneous mechanical and plumbing details

The mechanical design package included the plumbing plans. After reviewing the drawings, SIGIR determined that the mechanical and plumbing plans lacked details on the project requirements. However, the design drawing submittals supplemented the design drawings, so the combination of the drawings and submittals for the mechanical and plumbing systems appear to have the required details needed to adequately construct the project.

Electrical Design

The contractor submitted the 100% electrical drawings that included:

- layout of the lighting systems (interior and exterior)
- layout of the power and socket outlet systems
- layout of the grounding and lightning protection systems
- layout of the electrical system for mechanical equipment
- details on the cable trays, site raceways, and low voltage systems
- details for the transformer and fire protection system

The contractor's submitted 100% electrical design package, provided to SIGIR by the GRN Mosul Area Office, lacked details on the project requirements. However, the design drawings submittals combined with the 100% electrical design drawings appear to have the required details necessary to adequately construct the electrical systems for the project.

Structural Design

The 100% structural design drawings included:

- reinforcement and formwork plans for the building foundation
- reinforcement and formwork plans for the columns and beams
- steel truss sections, perspective views, anchorage, and connections
- roof purlins (supports) layout and sizing
- details and views of the structural steel design
- details for the building, water tank, and fuel tank slabs

The contractor's structural design package and structural calculations appeared to contain the majority of the required details necessary to adequately construct the project. However, one notable exception was the contractor's lack of detail for attaching the exterior canopy to the primary structure. This lack of detail allowed the contractor to improvise on the field construction that resulted in the eventual failure of the improvised connection of the canopy to the primary structure.

Based on SIGIR's review of the GRN-provided documentation, the SOW included detailed requirements and specifications that adequately instructed the contractor on how to design and construct the facility. The contractor provided the 35% and 100% design drawings to GRN for review and approval. At the time of the SIGIR assessment, the 100% design drawings were under GRN review, and the Rabeaa POE screening facility building construction was approximately 60% complete. SIGIR determined that the civil and architectural, mechanical and plumbing, and electrical design drawings lacked the necessary details for the project requirements. However, with the inclusion of additional calculations and design submittals to the design drawings, SIGIR determined that the mechanical, electrical, architectural, and structural designs were adequate to construct the facility.

Site Assessment

On 17 May 2009, SIGIR conducted an on-site assessment of the Rabeaa POE Screening Facility project. During the site visit, GRN Mosul Area Office representatives and the local Rabeaa security team accompanied SIGIR. Due to scheduling, the total time available on site was approximately two hours. This afforded the SIGIR assessment team with the ability to collect information for a limited project overview. Consequently, a complete review of all the work at the project site was not possible. At the time of the site assessment, SIGIR determined that the project was approximately 60% complete. The contractor had completed the following aspects of the project:

- rough grading for the screening facility site
- concrete foundations for the building
- reinforced concrete columns and perimeter beams
- erection of the steel structural trusses, sandwich panels, and roofing
- exterior and interior masonry walls
- generators and reinforced concrete pads
- diesel fuel tank concrete pad and containment walls
- water pump house and concrete water tank pad
- exterior concrete sidewalk

Although at the time of the site assessment no major construction was underway, there was evidence of recent unfinished construction of the following:

- sanitary sewer lines and septic tank
- structural shade for the sidewalk
- concrete floor for the building
- electrical conduit
- interior walls (metal studs)

Screening Building

The SOW called for the contractor to construct a 1,230 square meter, heated and cooled, screening facility. The screening facility building is divided into three separate areas that consist of two main offices and a screening area (Figure 2). The screening facility building contains the following areas and/or rooms:

- screening area
- data center room that will have a 30 centimeter raised floor with removable tiles
- three archive rooms
- six interrogation rooms
- two private screening rooms
- one meeting room
- two manager rooms
- two manager offices
- two secretary rooms
- two kitchen and tea rooms
- four male water closets
- four female water closets

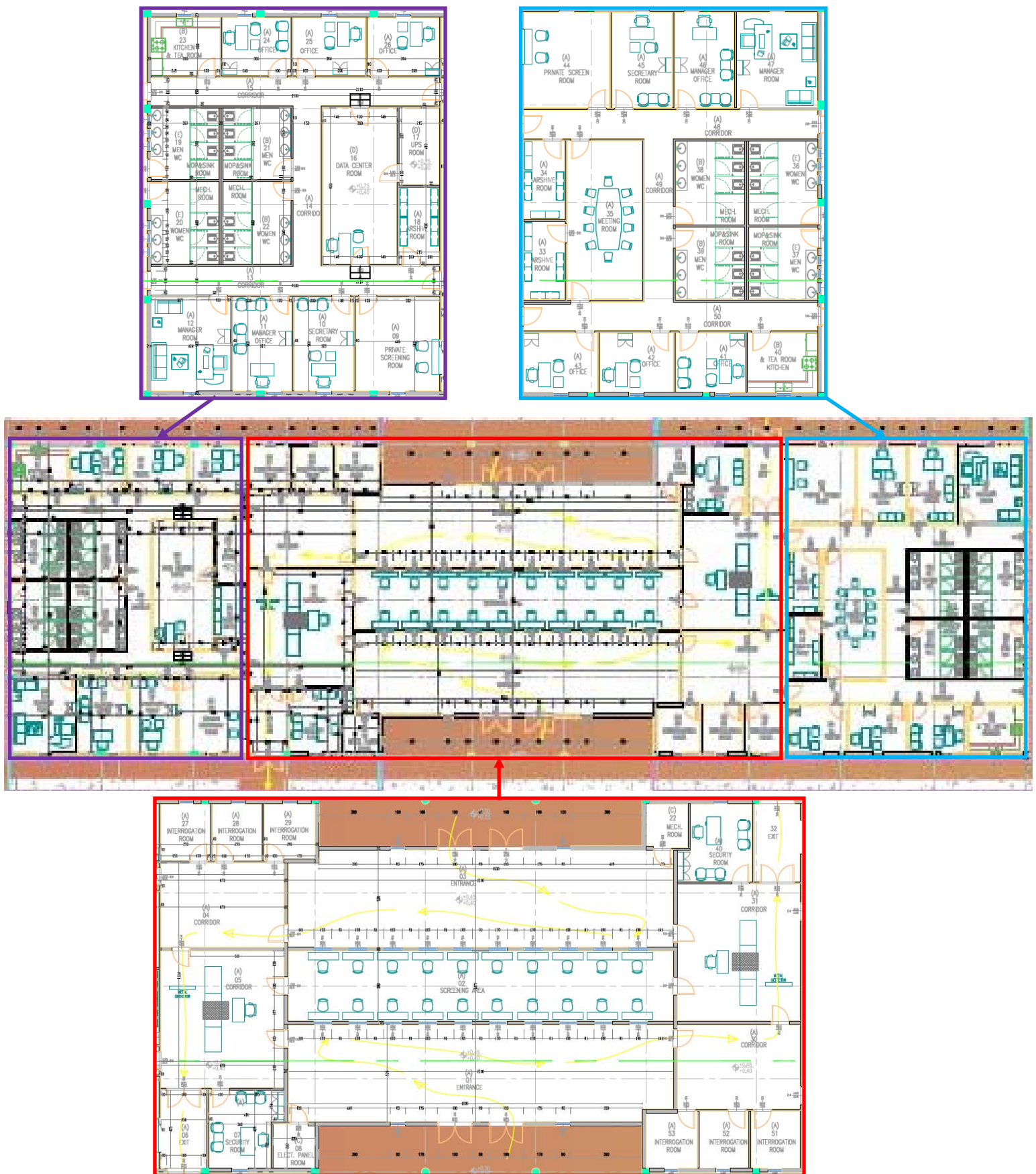


Figure 2. Screening facility (Courtesy of USACE)

The screening area is located in the center of the screening building, and is separated from the customers by six bank-type windows that are blast resistant on each side. One side of the screening area works traffic from Syria into Iraq, and the other side of the screening area works traffic from Iraq into Syria. Upon clearing the windows, the individual screened passes through an entrapment area before proceeding to the next screening area that contains a metal detector, and then proceeds into the other country (Figure 3).

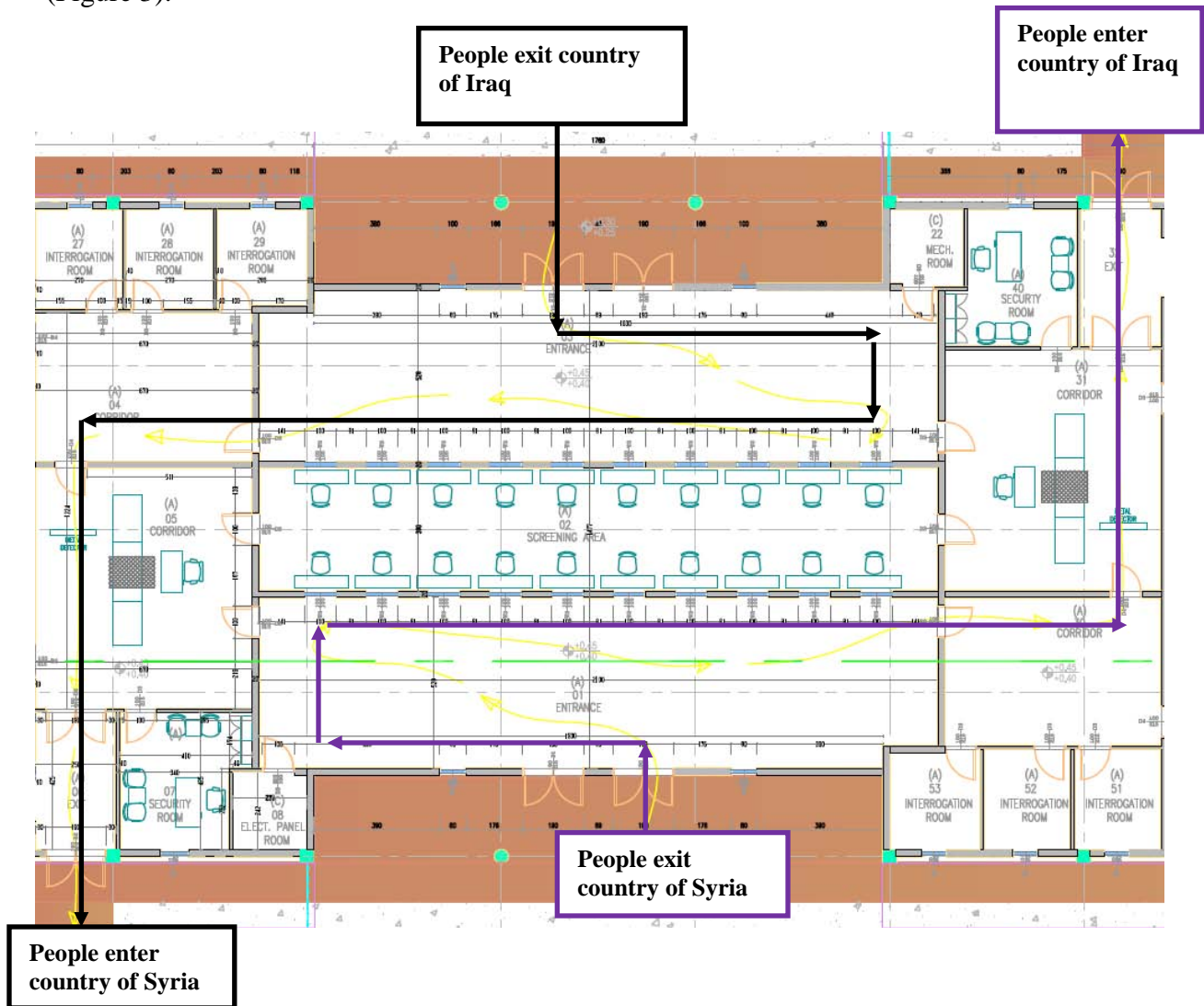
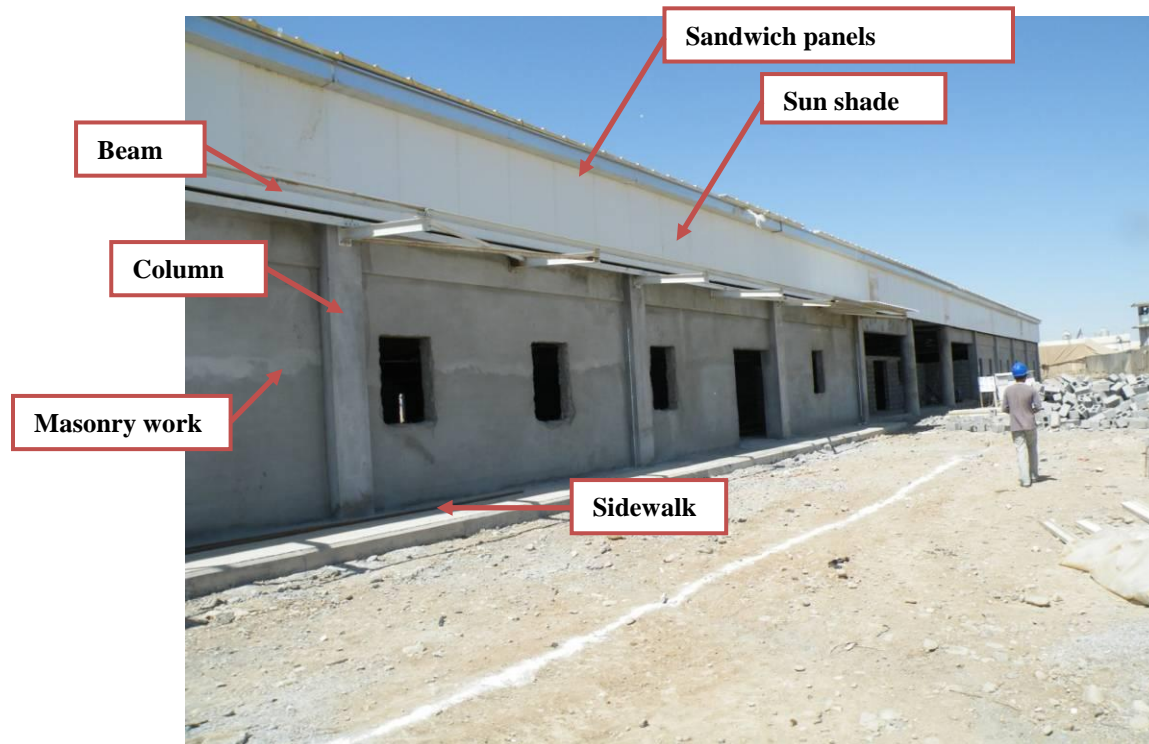


Figure 3. Foot traffic flow through the screening area (Courtesy of USACE)

At the time of the site assessment, the exterior frame of the screening building was constructed (Site Photo 1). SIGIR observed the construction of the sandwich panels, sun shade, beam, columns, masonry, and sidewalk of the screening building. The interior of the screening building was not complete. The interior walls of the screening area were partially constructed.



Site Photo 1. Exterior construction of the screening building

Outlying Structures to Support Screening Building

To support the Rabeaa POE screening facility, the SOW called for the contractor to provide 12,000 liters of water storage, provide and install at least a 2,000-liter septic tank, and provide and install a power generation plant with a minimum of one, one-megawatt diesel generator with two 2,000 liter fuel tanks and a manual transfer switch (Figure 4). Also, the contractor was to connect the facility to the water distribution system, sewage system, and commercial power, if feasible.

At the time of the site assessment, SIGIR noted that the contractor installed the generator on the generator pad (Site Photo 2), constructed the fuel tank base (Site Photo 3), and constructed the pump room (Site Photo 4).



Site Photo 2. Generator pad with generator

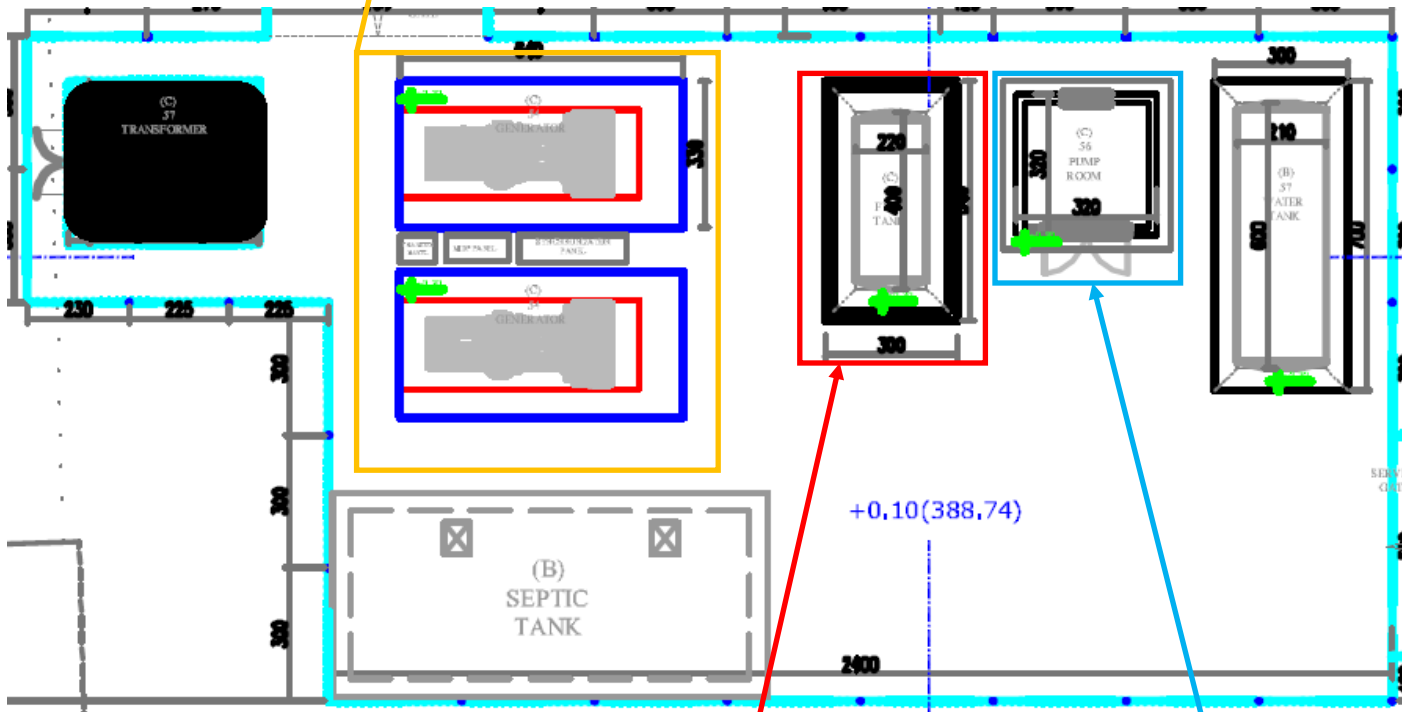


Figure 4. Outlying support for screening building (Courtesy of USACE)



Site Photo 3. Fuel tank base



Site Photo 4. Pump room

Construction Not Following the Statement Of Work

SIGIR conducted a limited site assessment; therefore, not all SOW requirements could be compared to actual field construction. However, during the site assessment, SIGIR observed the following areas of construction that do not adhere to the SOW.

The SOW requires the contracting officer's representative (COR) to approve the 35% and 100% design drawings prior to the start of any construction. According to the GRN Mosul Area Office representatives, the contractor was allowed to proceed with major construction even though the 100% design drawings were not approved. At the time of the site assessment, SIGIR did not have the 100% approved design drawings, but was able to determine that the construction of the project did not follow the SOW requirements.

The contract required that without the contracting officer's written approval, the contractor was to make "no changes to the work." Also, the SOW included in the solicitation and contract detailed requirements and specifications for the contractor to include in the proposal. If changes from the original requirements were approved, an appropriate cost adjustment should have been calculated. According to the GRN Mosul Area Office representative and current COR, the previous representative on this project was inexperienced and therefore was replaced. The GRN Mosul Area Office representative agreed that the construction of this project had not followed the SOW.

The conduit for future electrical wiring was embedded in the interior masonry walls (Site Photo 5). The SOW, Section 26.2.1 required that all building electrical lines were to be "surface mounted in conduit vice embedded." In addition, the conduit used did not match the COR approved product submittal.



Site Photo 5. Electrical conduit embedded in interior wall

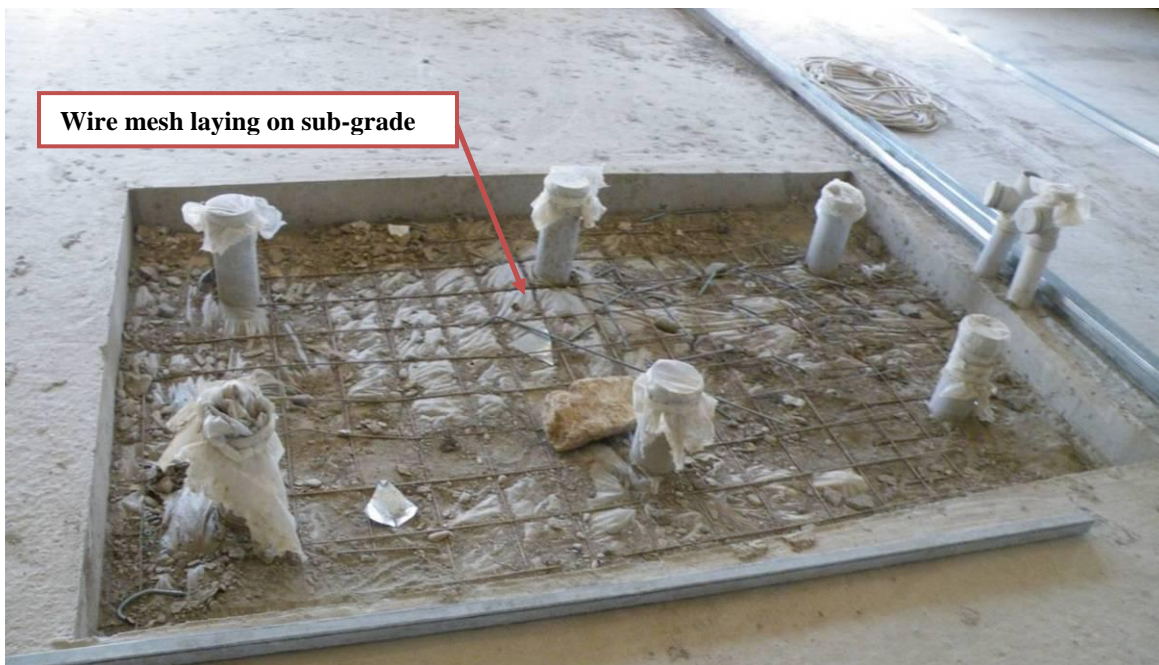
SOW, Section 22.5.3 required the contractor to use "schedule 40 galvanized steel pipes" and the water lines were to be surface mounted. The COR approved the use of a Turkish made product, pilsatherm (plastic) pipe, in a product data submittal. SIGIR noted that the COR approved a different water pipe product even though the pilsatherm pipe data submittal was unclear whether it met the International Plumbing Code standards as required by the SOW, Section 21.1.1. Also, the COR did not provide a contract price adjustment that should have been calculated when approving cheaper products and installation methods. At the time of the site visit, SIGIR noted that the potable water

lines were embedded in the masonry walls and were constructed using polypropylene (plastic) pipe (Site Photo 6).



Site Photo 6. “Pilsatherm” water pipes embedded along exterior wall

The SOW, Section 22.7.1 and 22.8.1 stated that the contractor was to provide sewer piping of “ductile steel with a minimum 100 millimeter (mm) diameter.” In the product data submittal documents provided by GRN, the COR approved the use of the Turkish pilsa (type of plastic) 9001 series pipe. Although SIGIR would not recommend the use of ductile steel pipe, the COR did not provide a contract price adjustment when approving the pilsa 9001 series pipe for the contractor to use. Also, the pilsa pipe data submittal provided by GRN was unclear as to whether the pilsa 9001 series pipe met the International Plumbing Code. At the time of the site assessment, the contractor installed the sanitary sewer piping under the concrete floor slab with polyvinyl chloride (plastic) pipe (Site Photo 7).



Wire mesh laying on sub-grade

Site Photo 7. “Pilsa 9001” sewer pipes under floor slab

Additional areas of concern that SIGIR and the GRN Mosul Area Office representative noted include potential changes to the generator requirements, concrete requirements, and storm sewer requirements. GRN should review these areas of concern and compare actual field construction versus the requirements of the SOW. In addition, GRN should determine if any cost savings are due to the U.S. government for the approval of alternative materials and methods.

Construction Not Following Design Drawings

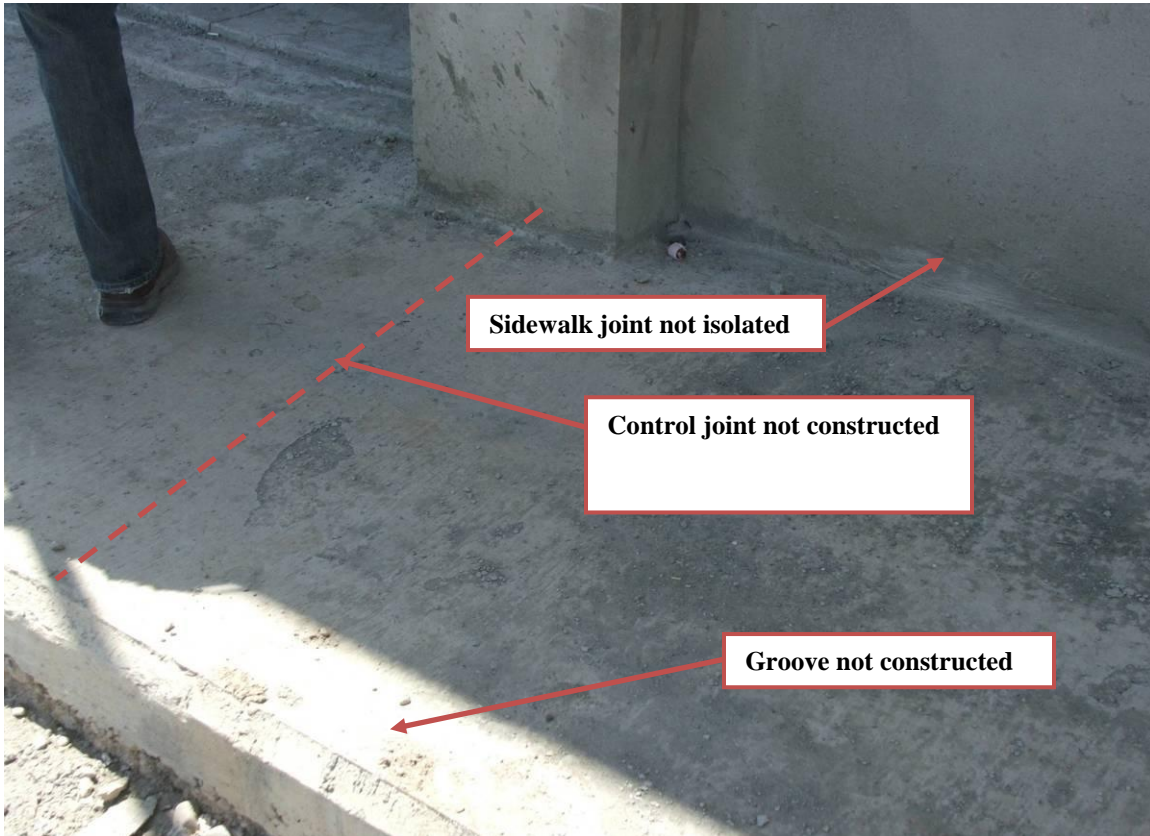
In addition to the changes in the SOW that the COR approved, SIGIR observed construction not adhering to the design drawings. Although the 100% drawings were not approved at the time of the inspection, SIGIR used the 100% design drawings and noted that the construction was not following the design drawings.

The concrete floor slab was constructed in two separate lifts (Site Photo 8). A thicker rough finish slab, estimated at 150mm thick, was poured throughout the building, except for areas where pipe penetrations were necessary. At the time of the site assessment, the contractor was starting to pour the second thinner mortar overlay, estimated to be 45mm thick, where the contractor was to lay the ceramic tile on top. SIGIR noticed that the construction of the floor slab showed improper jointing, unlevel construction, and cracking of the thin mortar overlay. In addition, SIGIR noticed from the missing sections of the floor slab that the wire mesh was laying on the sub-grade and was not lifted up properly (Site Photo 7).



Site Photo 8. Construction of mortar overlay on floor slab.

At the time of the site assessment, the exterior sidewalk was partially constructed; the construction was determined to be lacking an isolation joint next to the building, control joints, and a 200mm groove (Site Photo 9). Both the isolation joint and the groove were included in the 100% drawings submitted for approval (Figure 5). The control joints (contraction joints) were required every 1.2 meters (m) per a special note on the plans.



Site Photo 9. Construction of exterior sidewalk

Although the construction of the water pump house was partially completed, SIGIR noted that the construction of the raised concrete pump pad was not constructed in accordance with the drawings (Figure 6 and Site Photo 10). Specifically, the raised floor as submitted on the plans was a 1.8m square raised concrete pad. The actual construction of the raised concrete pad was not configured in a square and did not allow for access against one exterior wall. Once the booster pumps are placed on the concrete pad, the access to the electrical control panel could be impeded. The original design allowed for unimpeded access all around the raised pump pad.

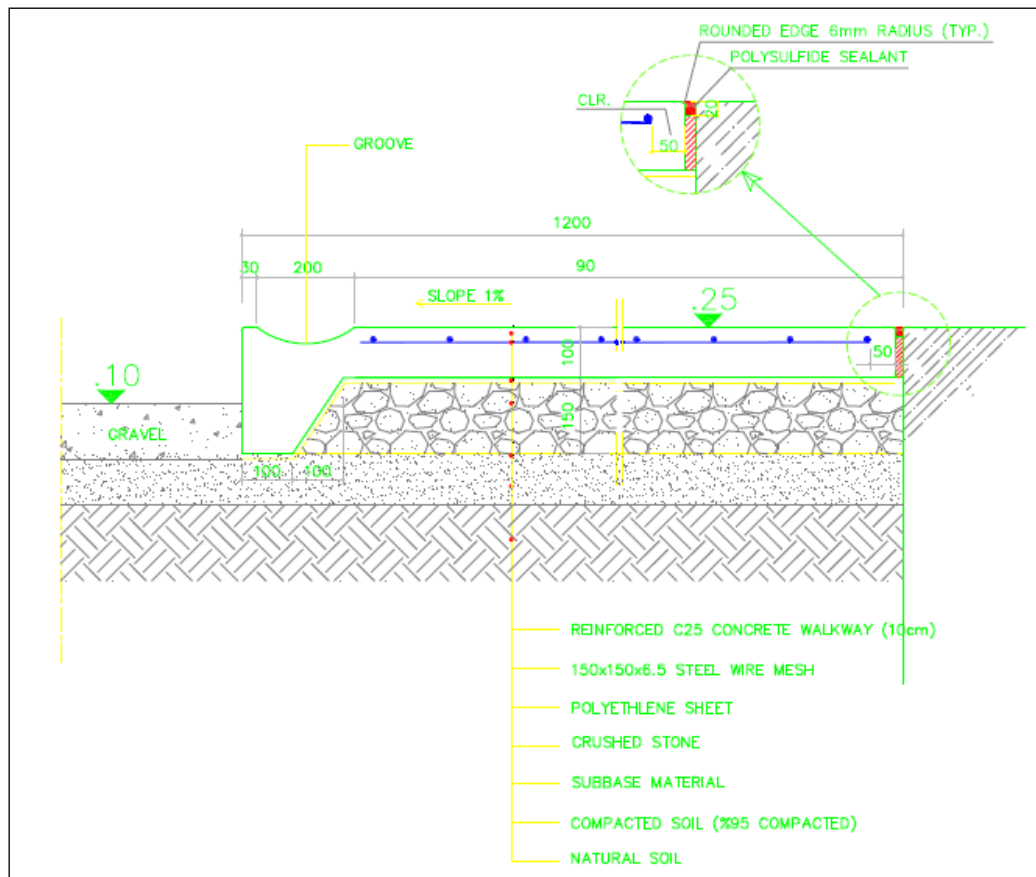


Figure 5. Sidewalk detail per the 100% design drawings (Courtesy of USACE)

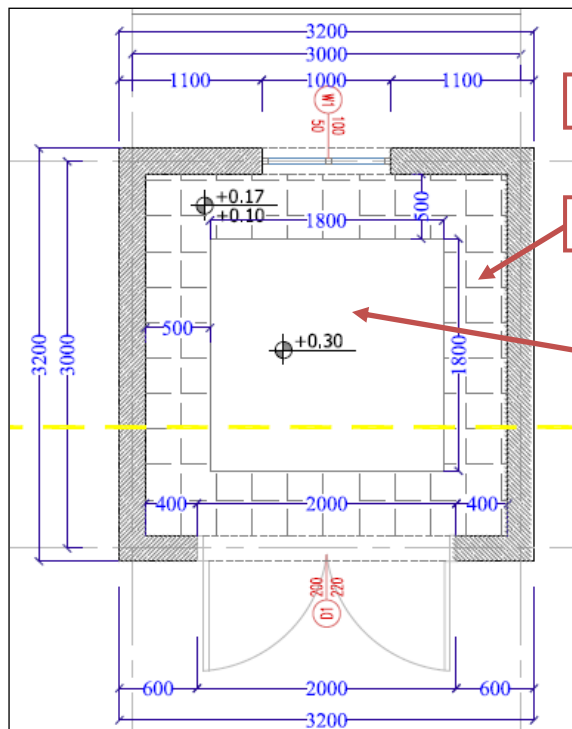
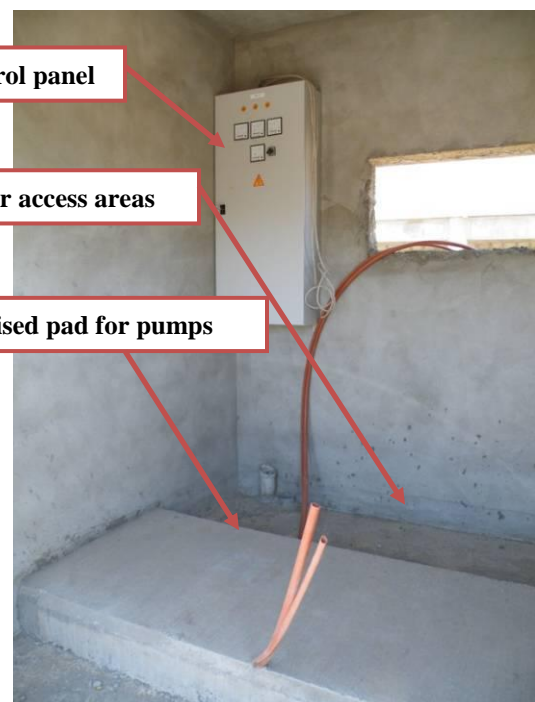


Figure 6. 100% Water pump room floor plan drawing (Courtesy of USACE)



**Site Photo 10. 100% Water pump room
- actual construction**

Additional areas of concern that SIGIR and the GRN Mosul Area Office representative noted include potential changes to the fuel tank spill protection structure and slab, the water tank slab, and the structural steel bolted connections. GRN should review these areas of concern and compare actual field construction versus the design drawing requirements.

Construction Defects Need Repair

At the time of the site assessment, SIGIR observed construction defects that needed repair. The GRN Mosul Area Office representative stated that the construction defects would be repaired.

The sanitary sewer manhole contained debris in the bottom of the manhole and the sewer line. Also, the manhole lacked any access steps (Site Photo 11).



Site Photo 11. Sanitary sewer manhole with debris and no access steps

SIGIR determined that the construction of the perimeter awning was defective and required repair. The anchor bolts that attached the steel structural shade to the building columns were not embedded in the columns correctly and caused damage to the column (Site Photo 12). Also, SIGIR noted that the contractor hit steel reinforcement while drilling holes for the anchor bolts, which caused damage to the columns (Site Photo 13). If the anchor bolts were embedded in the columns before pouring the columns, the need for drilling holes would have been unnecessary. SIGIR found no evidence that epoxy or expanding fasteners were used to ensure that the anchor bolts were securely fixed into the columns. The anchor bolts should be load tested prior to the structural members being erected.



Site Photo 12. Column damage from unsecured anchor bolts



Site Photo 13. Column damage from drilling holes for anchor bolts

SIGIR observed that the west end of the building contained significant cracking of the mortar surface coating of masonry block and concrete columns (Site Photo 14). The damage appeared limited to the west end of the building. However, SIGIR was unable to determine why the damage occurred, and informed the GRN Mosul Area Office representative that the cracking could be due to shrinkage.



Site Photo 14. Cracking of the surface coating on the block walls and columns

Safety Concerns

Further, SIGIR noted that the construction site continues to have on-going safety issues. According to GRN Mosul Area Office representatives, a “Stop Work Order” was issued on 17 March 2009, when an employee fell to his death while not following proper safety procedures. The “Stop Work Order” was on-going at the time of the site assessment and a review of the safety plans and on-site safety procedures was being conducted. SIGIR observed that the project site was unsafe due to the open excavations for the sanitary sewer lines and septic tank. The trench excavations either lacked shoring completely or were improperly braced (Site Photo 15).



Site Photo 15. Improperly braced shoring for septic tank construction.

Based upon the GRN Mosul Area Office documentation provided and the site assessment, SIGIR concluded that the construction of the Rabeaa POE Screening Facility project was not following the original requirements of the SOW, that the construction was not adhering to the design drawings, that the construction contains defects that need repair, and that safety at the construction site is an area of concern. Due to the limited time at the project site, SIGIR did not perform a complete construction assessment of the entire project.

Corrective Actions Taken Since Site Visit

Subsequent to the SIGIR site visit, the Mosul Area Office representative provided information and photographic confirmation of action taken by the contractor on the perimeter awning issue. The photograph shows the repaired awning connection with the epoxy adhered anchor bolts embedded in the columns (Site Photo 16).



Site Photo 16. Corrective fix to the perimeter awning (Courtesy of USACE)

Project Quality Management

Contractor's Quality Control Program

Department of the Army Engineering Regulation (ER) 1180-1-6, dated 30 September 1995, provides general policy and guidance for establishing quality management procedures in the execution of construction contracts. According to ER 1180-1-6, "...obtaining quality construction is a combined responsibility of the construction contractor and the government."

The contract required the contractor to submit an overall quality control (QC) plan that included implementing a three-phase QC control system (preparatory, initial, and follow-up phases) necessary to ensure the construction complies with the requirements of the contract. The QC representatives are responsible for preparing daily reports, identifying and tracking deficiencies, documenting progress of work, and supporting other contractor QC requirements. In addition, the SOW required the contractor to develop and maintain a complete list of QC testing and transferred and installed property.

The contractor submitted the QC plan, and revised the QC plan on 14 February 2009, which the GRN Mosul Area Office accepted as meeting the standards addressed in ER 1180-1-6.

The QC representatives monitored field activities and completed daily QC reports, which presented a brief background on the weather, number of workers on site, the work activities and testing performed, and documented deficiencies identified. In addition, the QC representatives supplemented the daily QC reports with photographs reinforcing the information provided in the daily reports. In the GRN documentation provided, the QC report documents identified minor deficiencies, such as the base needed more compaction and the surface needed smoothing for the finishing layer. However, the QC representatives did not identify how the deficiencies were resolved or provide photographs of the resolution in the QC reports.

Government Quality Assurance

According to the “Quality Assurance (QA) Plan and Standard Operating Procedure,” dated 17 February 2008, the QA verifies the effectiveness and accuracy of the contractor’s control system for producing quality work.

The Project Engineer’s responsibilities include: reviewing QA reports, reviewing QC test results, monitors the contractor submittal register to insure that the required submittals are received, and ensures the contractor is working in accordance with the health and safety requirements.

The QA representative (QAR) prepares the reports to ensure that deficiencies are documented with photographs. Also, the QAR reviews the contractor payment requests to ensure they are accurate and that payment is not allowed for work not performed. Further, the QAR reviews the contractor submittals to ensure the submittals were approved before starting the work.

The GRN Mosul Area Office, responsible for the construction of the Rabeea POE Screening Facility project, employs local-national Iraqi associate engineers to serve as QAR’s responsible for visiting the project site and writing QA reports. In addition, GRN Mosul Area Office representatives visited the project site to verify the contractor’s work.

Local-national QARs monitored field activities and completed daily QA reports. The reports document the number of workers on site and the work performed for the day. Also, the QARs supplement the daily QA reports with detailed photographs that reinforce the information provided in the reports.

SIGIR reviewed the daily QA reports and found that the QARs did not perform effectively in identifying and correcting construction deficiencies at the project site.

In the documentation provided by the GRN Mosul Area Office, the QA documentation did not begin until January 2009 and the construction deficiency list until March 2009. Although the QA deficiency list contains a description of the deficiency and the status of the deficiency, the QA documentation does not address the correction of the deficiency or when the deficiency was corrected. Also, the QAR does not use the photographs to show the deficiency and the correction of the deficiency.

Obtaining quality construction is the combined responsibility of the construction contractor and the government. The mutual goal is a quality product conforming to the contract requirements, and the contract documents establish the quality required for the project. In the review of the Rabeaa POE Screening Facility project, the execution of the QC and QA plans were not effective in obtaining quality construction and allowed construction to continue that did not meet the requirements of the SOW or the design. Also, deficiencies were identified in the QC and QA reports; however, the reports did not identify the corrections for the deficiencies.

Project Sustainability

The contract included sustainability elements to assist the Rabeaa POE Screening Facility project. The contract specifications require that the contractor provide a twelve month contractor-certified construction warranty for all material or equipment, which includes any mechanical, electrical and/or electronic devices. In addition, the contractor must provide and certify warranties in the name of the appropriate ministry. Further, the contractor must provide all operation and maintenance (O&M) manuals for all facility equipment, and is responsible for testing and commissioning of all mechanical and electrical systems. Specific contract requirements include:

Submittals

The contract required the contractor to provide submittals, which include the contractor or manufacturer's drawings (35% and 100%), catalog cuts, diagrams, operating charts, test reports, test cylinders, samples, certifications, training manuals, and warranties.

Spare Parts

The contract required the contractor to provide a recommended spare parts list for all equipment and a list of spare parts to be maintained on hand for six months of operation of the project.

As-built Drawings

Upon completion of the project, the contractor must provide as-built drawings (hard and electronic copies). Final as-built drawings will depict all deviations, modifications, alterations or changes incorporated into the facilities and construction footprint, which will include all new electrical, plumbing, and mechanical systems, as well as all known utility services on-site.

Warranty of Construction Work and Training

The contract states that the warranty for construction work continues for a period of 12 months from the date of final acceptance of the work. If the government takes possession of any part of the work before final acceptance, this warranty will continue for a period of one year from the date the government takes possession.

Further, the contractor is required to provide O&M training manuals for the components of these systems, including the spare parts listing. The contractor will provide O&M manuals for each piece of equipment and system, written in English and Arabic. The O&M manuals will include start up instructions, standard operating procedures, and standard maintenance procedures for each piece of equipment and/or system. The contractor will provide five complete manual copies, and the contractor will use the manuals in training the occupants in the proper operation and maintenance of the equipment and systems. The contractor will ensure that the O&M manuals and training provide a sufficiently trained and skilled labor force to adequately operate and maintain, in accordance with manufacturer's guidance, the installed equipment and systems throughout the warranty period. The contractor is to provide training on each of the following:

- (1) HVAC operation and maintenance
- (2) electrical systems including building, exterior and distribution
- (3) generator operation and maintenance
- (4) plumbing
- (5) fire alarm and fire fighting systems

Commissioning

The contract states that the contractor will demonstrate that all components and systems are fully operational and satisfy their required function. The contractor will test, adjust, balance, and regulate the systems and controls as necessary until the required conditions are met.

Also, the contract states that the contractor will prepare a commissioning plan, and will issue a Department of Defense Form 1354 after all of the following tasks have been completed:

- Final inspection of project by the contracting officer representative and the Title II or his/her designee.
- Resolution and completion of final punch list items.
- Delivery and acceptance of final as-built drawings and operation and maintenance manuals.

Conclusions

1. Project components were adequately designed prior to construction or installation.

The U.S. government, in the SOW, provided a conceptual floor plan of a 1,230 square meter heated and cooled single-story facility. Also, the SOW included specific requirements for the site utilities (water, sewer, and electrical systems) and interior finishes for the Rabeaa Point of Entry Screening Facility. The SOW required the contractor to develop the preliminary package into a complete design package. Specifically, the SOW required the contractor to submit 35% designs and 100% construction documents for approval, prior to the start of any construction.

SIGIR reviewed the contractor's 35% and 100% drawings. At the time of the SIGIR assessment, the 100% design drawings were under GRN review, and the contractor had not received 100% design approval. However, the GRN Mosul Area Office allowed the contractor to begin construction on the project without

100% design approval. SIGIR determined that the 100% structural design package and structural calculations were adequate to construct the project. Also, SIGIR determined that the civil, architectural, mechanical, plumbing, and electrical 100% design drawing submittals lacked some of the necessary details on the project requirements. However, with the contractor's inclusion of additional calculations and design submittals to the design drawings, SIGIR determined that the mechanical, electrical, architectural, and structural designs were adequate to construct the facility.

2. Construction was not in compliance with the standards of the design.

During the 17 May 2009 site assessment, SIGIR observed that construction work, such as rough grading for the screening facility site, concrete foundations, sanitary sewer lines and concrete floor was ongoing. The on-site visit was conducted in approximately two hours. At the time of the on-site visit, SIGIR determined that the project was approximately 60% complete.

SIGIR observed construction issues in which the contractor was not following the SOW, such as the conduit for future electrical wiring was embedded in the interior masonry walls and did not match the approved product submittal; the potable water lines were embedded in the masonry walls and were constructed using polypropylene pipe. Additional areas of concern include potential changes to the generator requirements, concrete requirements, and storm sewer requirements.

Secondly, SIGIR observed construction issues in which the contractor was not following the design drawings, such as:

- improper jointing of the concrete floor slab
- unlevel construction of the concrete floor slab
- cracking of the thin mortar overlay of the concrete floor slab
- exterior sidewalk construction lacking an isolation joint next to the building
- exterior sidewalk construction lacking control joints
- exterior sidewalk construction lacking 200mm groove
- water pump house floor's actual construction of the raised concrete pad was not configured in a square and did not allow for access against one exterior wall

Other potential areas of concern included changes to the fuel tank spill protection structure and slab, the water tank slab, and the structural steel bolted connections.

Thirdly, SIGIR observed construction defects that the contractor needed to repair. Specifically, the sanitary sewer manhole contained debris in the bottom of the manhole and the sewer line. Also, the manhole lacked access steps. In addition, the west end of the building contained significant cracking of the mortar surface coating of masonry block and concrete columns.

Lastly, SIGIR noted that the construction site continues to have ongoing safety issues. The project site was unsafe due to the open excavations for the sanitary sewer lines and septic tank. The trench excavations either lacked shoring completely or were improperly braced.

SIGIR concluded based on the GRN documentation and the site assessment that the construction of the Rabeaa Point of Entry Screening Facility was not

following the requirements of the SOW; the construction was not adhering to the design drawings and contained defects needing repair; and the construction site has ongoing safety issues. Due to limited time on site a complete construction assessment of all the problems could not be performed.

SIGIR discussed these issues identified with the GRN Mosul Area Office personnel, specifically, the contractor not adhering to the SOW and the design drawings. Also discussed was the construction work that contained some defects which required repair and the construction site's ongoing safety issues. The GRN Mosul Area Office personnel stated that the contractor would repair the construction defects and the GRN Mosul Area Office personnel would address the construction site's ongoing safety issues. The other issues would be addressed throughout the project and corrective action would be taken as necessary.

3. Adequate quality management programs were not being effectively used.

The contractor's QC plan implementation and the U.S. government's application of the QA program were not effective in monitoring project construction. The contractor's QC plan was sufficiently detailed to effectively guide the contractor's quality management program and met the standards addressed in Engineering Regulation 1180-1-6 (*Construction Quality Management*). The QC representatives monitored field activities and completed daily QC reports, which presented a brief background on the number of workers on site, the work activities performed and major equipment on site and documented minor deficiencies. However, the QC representatives did not identify how the deficiencies were resolved or provide photographs of the resolution in the QC reports.

The QA representative's reports should also document by photographs that deficiencies are corrected. Also, the QA representatives review contractor payment requests to ensure that they are accurate and that payment is not made for work not performed. Further, the QA representatives review the contractor submittals to ensure the submittals were approved before starting the work.

SIGIR reviewed the daily QA reports and found that the QA representatives did not perform effectively in identifying and correcting construction deficiencies at the project site. In the documentation provided by the GRN Mosul Area Office, the QA deficiency list contains a description of the deficiency and the status of the deficiency; however, the QA documentation provided did not address the correction of the deficiency or when the deficiency was corrected. Also, the QA representative did not use the photographs to show the deficiency and the correction of the deficiency. SIGIR reviewed the QA reports and found that the QA representatives were not effective in identifying and correcting construction deficiencies at the project site.

Obtaining quality construction is the combined responsibility of the construction contractor and the government. The mutual goal is a quality product conforming to the contract requirements, where the contract documents establish the quality required for the project. In the review of the Rabeaa Point of Entry Screening Facility the QC and QA were not effective in obtaining quality construction. The QC and QA allowed construction to continue that did not meet the SOW or the design. Also, the QC and QA identified deficiencies in the reports; however, the QC and QA reports did not identify the corrections for the deficiencies.

4. Sustainability was addressed in the contract or task order for the project.

Sustainability was addressed in the contract requirements. The contract included sustainability elements to assist the Iraqi ministry ultimately responsible for operating this project after turnover. The contract specifications require the contractor to provide and certify warranties in the name of the appropriate ministry for all materials and equipment. In addition, the contractor is required to perform operations and maintenance training appropriate to the facilities and equipment installed, constructed, or rehabilitated in the scope of this project, along with providing operations and maintenance manuals. Further, upon completion of each facility, the contractor must prepare and furnish as-built drawings, which are to be a record of the construction as installed and completed.

5. Project results were or will be consistent with their original objectives.

As discussed in this report, the SIGIR inspection disclosed instances of deficient construction, and noncompliance with the contract SOW and design documents. However, the Rabeaa Point of Entry Screening Facility project results should meet the objectives of providing a new POE screening facility at the existing Rabeaa Point of Entry. The project is to consist of a new screening facility construction in support of the existing POE, and construction of multiple support structures, such as the water distribution system, septic system, electrical distribution, a one-megawatt generator, and demolition of previous buildings. As of 17 May 2009, when SIGIR performed an on-site assessment of the Rabeaa Point of Entry Screening Facility, the project was approximately 60% complete, and included the deficiencies noted in this report. However, if deficiencies are corrected the new screening facility and the ancillary buildings and support structures should meet contract requirements.

Recommendations

SIGIR recommends that the Mosul Resident Office:

1. Review the following areas of concern and compare actual field construction versus the requirements of the Statement of Work. In addition, the Gulf Region District should determine if any cost savings are due to the U.S. government for the approval of alternative materials and methods.
 - a. SOW, Section 22.5.3 required the contractor to use “schedule 40 galvanized steel pipes” and the water lines were to be surface mounted. The COR approved the use of the Turkish made product, pilsatherm pipe, in a product data submittal. The COR did not provide a contract price adjustment that should have been calculated when approving cheaper products and installation methods.
 - b. SOW, Section 22.7.1 and 22.8.1 stated that the contractor was to provide sewer piping of “ductile steel with a minimum 100 mm diameter.” In the product data submittal documents provided by GRN, the COR approved the use of the Turkish pilsa 9001 series pipe. The COR did not provide a contract price adjustment, when approving the pilsa 9001 series pipe for the contractor to use.
2. Compare actual field construction versus the design drawing requirements, and determine if the contractor should redo the construction or if any cost savings are due to the U.S. government for the contractor not following the designs for:

- a. Improper jointing and unlevel construction of the concrete floor slab and cracking of the thin mortar overlay.
 - b. Exterior sidewalk construction that was lacking control joints, a 200mm groove, and isolation joints next to the building.
 - c. Construction of the raised concrete pad of the water pump house floor that was not square and did not allow for access to one exterior wall.
3. Require the contractor to repair any construction defects without cost increases to the U.S. government. Specifically:
 - a. Remove debris in the bottom of the manhole and the sewer line
 - b. Provide access steps to the manholes
 - c. Repair the west end of the building cracking of the mortar surface coating of masonry block and concrete columns
4. Enforce the contractor safety plan.
5. Implement controls to ensure that the procedures outlined in the QA and QC plans of the project are applied.

Management Comments

SIGIR received comments on a draft of this report from the USACE, Gulf Region District (GRD) concurring with the recommendations and noting that it generally agreed with the facts in the report. GRD had provided SIGIR with documentary evidence and photographs of corrective actions taken before issuance of the draft report. GRD's comments on the draft report provided additional photographs and documentary evidence of further corrective action subsequent to the issuance of the draft report. The complete texts of the comments are provided in Appendix C.

The Gulf Region District also noted that USACE in Iraq is undergoing reorganization. As a result of the reorganization two districts – Gulf Region Central and Gulf Region North – merged in July 2009 to form Gulf Region District. Further, the Mosul Area Office is now the Mosul Resident Office.

Evaluation of Management Comments

SIGIR appreciates the concurrence with the draft report's recommendations and corrective action taken by Gulf Region District. Their comments addressed the issues identified in our recommendations. As a result, no additional comments are required.

Appendix A. Scope and Methodology

SIGIR performed this project assessment from April 2009 through December 2009 in accordance with the Quality Standards for Inspections issued by the Council of Inspectors General on Integrity and Efficiency. The assessment team included two engineers/inspectors and two auditors/inspectors.

In performing this Project Assessment SIGIR:

- Reviewed documentation to include the following: contract W917BE-08-C-0066, award letter, contract amendments and/or modifications, Notice To Proceed, **and the** Statement of Work;
- Reviewed contractor quality control plan, contractor quality control reports and photographs, government quality assurance reports, and quality assurance photographs;
- Reviewed the design package (plans) and submittals; and
- Conducted an on-site assessment on 17 May 2009 and documented results of the Rabeaa Point of Entry Screening Facility project in Rabeaa, Iraq.

Scope Limitation. The time allotted for the Rabeaa Point of Entry Screening Facility project site assessment was approximately 2 hours; therefore, a complete review of all work completed and ongoing was not possible.

Appendix B. Acronyms

COR	Contracting Officer's Representative
GRD	Gulf Region District
GRN	Gulf Region Division, Northern District
HVAC	Heating, Ventilating, and Air Conditioning
m	Meter
mm	Millimeter
O&M	Operations and Maintenance
POE	Point of Entry
QA	Quality Assurance
QC	Quality Control
SIGIR	Special Inspector General for Iraq Reconstruction
SOW	Statement of Work
USACE	U.S. Army Corps of Engineers

Appendix C. GRD Comments on Draft Report



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
GULF REGION DISTRICT
ARMY CORPS OF ENGINEERS
APO AE 09342



CETAG

15 December 2009

MEMORANDUM FOR Special Inspector General for Iraq Reconstruction, US Embassy Annex II, Room 1013, APO AE 09316

SUBJECT: Draft SIGIR Audit Report – Rabeaa Point of Entry Screening Facility (SIGIR PA-09-173)

1. This memorandum provides the U.S. Army Corps of Engineers, Gulf Region District response to the subject draft audit report.
2. The Gulf Region District reviewed the subject draft report and generally agrees with the facts as presented in the report. Gulf Region District provided additional comments for clarity and accuracy in the enclosure.
3. Thank you for the opportunity to review the draft report and provide written comments for incorporation in the final report.
4. If you have any questions, please contact Mr. Robert Jones at (540) 678-2996 or via email Robert.A.Jones@usace.army.mil.

Encl
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Appendix C. GRD Comments on Draft Report

**GULF REGION DISTRICT
COMMAND REPLY**

to

**SIGIR Draft Audit Report – Rabea'a Point of Entry Screening Facility
(SIGIR Project PA 09-173)**

Overall Comment. Gulf Region District generally agrees with the facts in the report. However, the District provided SIGIR photographs showing the correction of construction defects with the awning SIGIR observed during their site visit in May 2009. Further, the resident office directed the contractor to clear debris from the manhole, install access steps, and repair cracks on the west wall. Photos of the west wall accompany comments to the recommendation. Recommendation one, field construction versus statement of work requirements, was subsequently addressed also; see photos.

USACE in Iraq is undergoing reorganization. As a result of the reorganization two districts--Gulf Region Central and Gulf Region North--merged in July 2009 to form Gulf Region District. Further, the Mosul Area Office is now the Mosul Resident Office.

Recommendation 1. Review the following areas of concern and compare actual field construction versus the requirements of the Statement of Work. In addition, the Gulf Region District should determine if any cost savings are due to the U.S. government for the approval of alternative materials and methods.

- a. SOW, Section 22.5.3 required the contractor to use "schedule 40 galvanized steel pipes" and the water lines were to be surface mounted. The COR approved the use of the Turkish made product, pilsatherm pipe, in a product data submittal. The COR did not provide a contract price adjustment that should have been calculated when approving cheaper products and installation methods.
- b. SOW, Section 22.7.1 and 22.8.1 stated that the contractor was to provide sewer piping of "ductile steel with a minimum 100 mm diameter." In the product data submittal documents provided by GRN, the COR approved the use of the Turkish pilsa 9001 series pipe. The COR did not provide a contract price adjustment, when approving the pilsa 9001 series pipe for the contractor to use.

Response: Concur. The resident office has addressed the variance. Resident office personnel directed the contractor to replace the pilsatherm pipes SIGIR documented during their review with galvanized steel pipes cited in the statement of work. See photos below.

Appendix C. GRD Comments on Draft Report

GULF REGION DISTRICT
COMMAND REPLY
to
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Recommendation 2. Compare actual field construction versus the design drawing requirements, and determine if the contractor should redo the construction or if any cost savings are due the U.S. government for the contractor not following the designs for:

- a. Improper jointing and unlevel construction of the concrete floor slab and cracking of the thin mortar overlay.
- b. Exterior sidewalk construction that was lacking control joints, a 200mm groove, and isolation joints next to the building.
- c. Construction of the raised concrete pad of the water pump house floor that was not square and did not allow for access to one exterior wall.

Response: Concur. The resident office will compare actual to design drawings and determine whether cost savings are due the government. The results of a cost-benefit analysis will be the determining factor in determining the course of action the District will pursue.

Recommendation 3. Require the contractor to repair any construction defects without cost changes to the U.S. government. Specifically:

- a. Remove debris in the bottom of the manhole and the sewer line
- b. Provide access steps to the manholes
- c. Repair the west end of the building cracking of the mortar surface coating of masonry block and concrete columns

Response: Concur. The resident office took action and had the contractor clear the debris from the bottom of the manhole and sewer line, as well as, install access steps in the manholes. The cracking on the west wall was repaired as shown by the photo dated August 2009. The cracking on the west end of the building was cosmetic as evidenced by the diagonal direction of the crack on site photo

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14, page 17 of the report. Had the crack been a structural default the crack would have been more vertical or horizontal.



Recommendation 4. Enforce the contractor safety plan.

Response: The contractor has completed the project. The project was completed on 5 September 2009 and turned over to the customer on 12 September 2009.

Recommendation 5. Implement controls to ensure that the procedures outlined in the QA and QC plans of the project are applied.

Appendix C. GRD Comments on Draft Report

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to

**SIGIR Draft Audit Report – Rabea'a Point of Entry Screening Facility
(SIGIR Project PA 09-173)**

Response: Concur. Gulf Region District will review its quality assurance procedures and revise and/or implement controls where necessary to ensure adherence to established procedures and that contractors abide by their quality control plans.

Appendix D. Report Distribution

Department of State

Secretary of State

Senior Advisor to the Secretary and Coordinator for Iraq

Director of U.S. Foreign Assistance/Administrator, U.S. Agency for
International Development

Director, Office of Iraq Reconstruction

Assistant Secretary for Resource Management/Chief Financial Officer,
Bureau of Resource Management

U.S. Ambassador to Iraq

Director, Iraq Transition Assistance Office

Mission Director-Iraq, U.S. Agency for International Development

Inspector General, Department of State

Department of Defense

Secretary of Defense

Deputy Secretary of Defense

Under Secretary of Defense (Comptroller)/Chief Financial Officer

Deputy Chief Financial Officer

Deputy Comptroller (Program/Budget)

Deputy Assistant Secretary of Defense-Middle East, Office of Policy/International
Security Affairs

Inspector General, Department of Defense

Director, Defense Contract Audit Agency

Director, Defense Finance and Accounting Service

Director, Defense Contract Management Agency

Department of the Army

Assistant Secretary of the Army for Acquisition, Logistics, and Technology

Principal Deputy to the Assistant Secretary of the Army for Acquisition,
Logistics, and Technology

Deputy Assistant Secretary of the Army (Policy and Procurement)

Commanding General, Joint Contracting Command-Iraq/Afghanistan

Assistant Secretary of the Army for Financial Management and Comptroller

Chief of Engineers and Commander, U.S. Army Corps of Engineers

Commanding General, Gulf Region Division

Chief Financial Officer, U.S. Army Corps of Engineers

Auditor General of the Army

U.S. Central Command

Commanding General, Multi-National Force-Iraq

Commanding General, Multi-National Corps-Iraq

Commanding General, Multi-National Security Transition Command-Iraq

Commander, Joint Area Support Group-Central

Other Federal Government Organizations

Director, Office of Management and Budget
Comptroller General of the United States
Inspector General, Department of the Treasury
Inspector General, Department of Commerce
Inspector General, Department of Health and Human Services
Inspector General, U.S. Agency for International Development
President, Overseas Private Investment Corporation
President, U.S. Institute of Peace

Congressional Committees

U.S. Senate

Senate Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Foreign Relations
Senate Committee on Homeland Security and Governmental Affairs

U.S. House of Representatives

House Committee on Appropriations
House Committee on Armed Services
House Committee on Oversight and Government Reform
House Committee on Foreign Affairs

Appendix E. Project Assessment Team Members

The Office of the Assistant Inspector General for Inspections, Office of the Special Inspector General for Iraq Reconstruction, prepared this report. The principal staff members who contributed to the report were:

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